

IN THE FIGURES

Applicants hereby submit replacement drawing sheets corresponding to FIGS. 1a and 1b, in compliance with 37 C.F.R. 1.121(d). FIG. 1a has been updated to omit reference character "21." FIG. 1b has been updated to omit reference characters "21" and "68."

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REMARKS

Claims 1-19 were previously presented for examination. Pursuant to the Non-Final Office Action dated January 3, 2007, claims 1-19 are presented herewith. Claims 1, 6, 8-9, 13, and 14 have been amended. Claims 2-5, 7, 10-12, and 15-19 are as originally presented.

Support for amended claim 1 is provided, for example, by original claim 1. Support for amended claims 9, 13, and 14 is provided by original claims 9, 13, and 14, respectively. Support is also found on page 9 of the specification, lines 10-33 and by the paragraphs on page 15, line 37 through page 16, line 32. Further support is provided on page 8, lines 9- 23 and on page 17, lines 14-37.

Pursuant to the Examiner's request for correction, claims 6 and 8 have been rewritten to correct a typographical error. The typographical error appearing on page 3, line 33 has also been corrected.

As set forth hereinabove, Applicants have updated the reference to related applications (priority claim) section of the patent application. Pursuant to the Examiner's request, Applicants enclose herewith replacement drawing sheets updating FIGS. *1a* and *1b* to omit certain reference characters. Applicants affirm that no new matter has been added to the patent application. Applicants hereby request careful reconsideration of this application in view of the following comments and revisions to the claims.

RESPONSE TO 35 U.S.C. § 102 REJECTION

Claims 1-2, 4-8, and 14-19

Claims 1-2, 4-8, and 14-19 are rejected under 35 U.S.C. § 102(b) as being anticipated by Karger, *et al.*, U.S. Patent No. 5,633,129 ("Karger"). Applicants request withdrawal of this rejection since the present teachings recite novel methods and other features that explicitly distinguish claims 1-2, 4-8, and 14-19 from Karger.

The present teachings disclose a vast temperature ramp that employs a temporal gradient, whereby a capillary is exposed to a continuous temperature range. This processing technique enables, for example:

varying samples to be run in different capillary lanes;
without prior knowledge of the sample melting points.

Conversely, the ‘129 patent to Karger provides ample evidence in support of the sensitive nature of its method of analysis. Primarily, the experimental setup of Karger suggests that a temperature ramp is undesirable for the reason that slight differences in temperature, e.g. on the order of 1 °C, can result in gross dissimilarities in sample migration (*see* Figure 8). Thus, Karger relies on fixed temperatures during the denaturing step of the analysis. The temperature range employed represents the overall range where a fixed value resides. The purpose of the disclosed range is to identify sample iso-melting points in order to reproduce experiments under constant temperature and denaturing conditions. (*See* column 14, lines 48-50).

Furthermore, Karger specifies that prior knowledge of sample melting points is necessary. That is, “high” and “low” temperature values must be known in order to successfully separate the species. Experimental determination of these iso-melting temperatures is described, for example, in column 13, lines 48-50. Predictive computational methods are disclosed in column 9, lines 33-46. In each experimental example presented in Karger, the need for prior knowledge of the iso-melting points is reaffirmed. Karger is strictly limited to fixed temperature analyses.

Karger discloses the separation of heteroduplexes using a replaceable electrophoretic matrix under partially denaturing conditions. Karger requires that the analysis take place “within a certain range of denaturant concentrations and/or temperature.” (*See* column 2, line 66 through column 3, line 1). Moreover, the DNA sequence is required to have “both a high temperature and a low temperature iso-melting domain” in order to ensure the existence of both the unmelted and partially melted states of the analytes. (*See* column 2, lines 64-66).

In Karger, it is necessary for the separation temperature and denaturing conditions of the matrix to be both above the low iso-melting temperature of the analyte and below the high iso-melting value. (*See* column 2, lines 56-59). Notably, the temperature difference between high and low iso-melting temperatures is narrow, i.e., approximately 5 °C.

Karger does not disclose a method integrating a broad temperature ramp that employs a temporal gradient, whereby a matrix is exposed to a continuous temperature range. The processing techniques recited in pending claims 1-19 enable, for example, different samples to be

run in separate lanes without prior knowledge of the sample melting points. Hence, Karger does not anticipate independent claims 1 and 14 or their respective dependent claims. Applicants respectfully request withdrawal of the § 102 rejection in view of the foregoing comments and the revisions to independent claims 1 and 14.

RESPONSE TO 35 U.S.C. § 103 REJECTION

Claims 3 and 9-13

Claims 3 and 9-13 are rejected under 35 U.S.C. § 103(a) as being obvious over Karger in view of Cottrell, *et al.*, U.S. Patent No. 4,254,249 (“Cottrell”).

Applicants respectfully request withdrawal of the § 103 rejection since, as discussed hereinabove, Karger does not disclose or suggest claims 3 and 9-13. Moreover, Applicants have revised independent claim 1, from which claim 3 depends, to accentuate the novel processing steps utilized by the present teachings. Applicants have also revised independent claim 9, from which claims 10-12 depend, and independent claim 13 to accentuate the novel method of the present teachings. These and other features of Applicants’ teachings explicitly distinguish the pending claims from Karger and Cottrell, both singularly and in combination.

In construing § 103, the United States Court of Appeals for the Federal Circuit has stated:

A reference is not available under 35 U.S.C. § 103 if it is not within the field of the inventor’s endeavor and was not directly pertinent to the particular problem with which the inventor was involved.

King Instrument Corp. v. Otari Corp., 767 F.2d 853 (Fed. Cir. 1985).

Primarily, Applicants submit that Cottrell is not available as prior art against the present application. Cottrell is non-analogous art and therefore cannot properly be combined with Karger. Cottrell discloses copolymers for use in petroleum recovery operations. (*See abstract*). One such copolymer is a copolymer of N,N-dimethylacrylamide and acrylamide. Cottrell, however, neither discloses nor suggests the use of copolymers for electrophoresis or other separation applications.

Cottrell does not disclose, teach, or fairly suggest the use of polymer formulations having utility as a separation medium as set forth in pending claims 3 and 9-13. Therefore, Applicants

respectfully request withdrawal of the § 103 rejection in view of the foregoing comments and the revisions to independent claims 1, 9, and 13.

RESPONSE TO OBVIOUSNESS-TYPE DOUBLE PATENTING REJECTION

Claims 1, 3, 5-6, 9-11, and 13-14

Claims 1, 3, 5-6, 9-10, and 14 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 15 of U.S. Patent No. 6,926,815 in view of Karger, *et al.* Claims 11 and 13 are rejected as being unpatentable over claim 20 of U.S. Patent No. 6,926,815.

Applicants have submitted a Terminal Disclaimer in accordance with 37 C.F.R. § 1.321, showing that U.S. Patent No. 6,926,815 is commonly owned with this application. SpectruMedix LLC is the owner of the right, title, and interest in the present application and U.S. Patent No. 6,926,815. The documents in the chain of title from the inventors of the present application and the '815 patent to SpectruMedix LLC are identified in the enclosed "Statement Under 37 C.F.R. § 3.73(b)." The appropriate fee under 37 C.F.R. § 1.20(d) is enclosed.

Applicants have taken appropriate action to overcome the double patenting rejection. Therefore, Applicants request withdrawal of this rejection and reconsideration of this patent application.

Applicants submit that presently pending claims 1-19 are in condition for allowance. Accordingly, entry and careful consideration of this Response and an early indication of allowance is hereby requested. If the Examiner believes there is any issue that could be resolved by a telephone conference or a personal interview, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.



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